We must not conclude without referring to the excellent observations on the divisions proposed in the great genus *Papilio* by Dr. Horsfield, nor to the very careful manner in which the synonymy of the old and the description of the new species have been worked out by Mr. Moore. We could have wished that the classical system of giving short Latin characters of each species had been adopted, as we know by experience how apt entomologists are to overlook descriptions of species written only in the vernacular language of authors of other countries. We trust, in conclusion, that this volume is only the precursor of several others, in which the remainder of the Order will be described. We know that there are ample materials for such additional volumes, and we trust that Dr. Horsfield will be spared to see their publication.

General Report upon the Zoology of the several Pacific Railroad Routes. Part I. *Mammals.* By Spencer F. Baird. 1 vol. 4to. Washington, 1857.

The contributions already made to our knowledge of the Fauna of North America by the zoological appendices to the Reports of various Surveys and Explorations ordered by the Government of the United States, are neither few nor unimportant. The accounts of expeditions to the Red River of Louisiana, the Great Salt Lake of Utah, and the Zuni and Colorado Rivers, all contain materials worthy of much attention, and especially calculated to throw light upon the theory of the distribution of animal life in the North American continent. And in the Reports of the recent U. S. Astronomical Survey in the Southern Hemisphere, and of Commodore Perry's Japan expedition, we have evidence that the American Government is sufficiently 'catholic' in its promotion of scientific investigation not to refuse assistance in extending our knowledge of the zoology of other parts of the world besides those immediately subject to its sway. The seventh volume of the 'Reports of Explorations and Surveys to ascertain the most practicable and economical route for a Railroad from the Mississippi to the Pacific Ocean, made under the direction of the Secretary of War in 1853–56,' the title of the first part of which is given above, promises to bring still greater additions to our knowledge of North American Zoology than any of the previous publications. This first part only embraces the *Mammalia*; but if the Birds, Reptiles, Amphibians, Fishes, and other orders of organized beings are treated of in the same way, the result will be a complete and very interesting *résumé* of the zoology of this portion of the globe. The numerous different surveying parties which were employed on the proposed Pacific railway-routes, amassed a very large quantity of materials for scientific research, which were all transferred by the U. S. Government to the guardianship of the Smithsonian Institution at Washington. The energetic Assistant-Secretary of that establishment, Professor Baird—than whom no one could be found better qualified for the task—has himself undertaken to work out the specimens of Mammalia collected. The same gentleman, together

with Mr. Cassin, the well-known ornithologist, will take the Birds. The Reptiles will probably be assigned to Prof. Girard or Dr. Hallowell, and the other Orders to the naturalists best qualified to deal with them. This is an excellent method—putting the "right man in the right place," instead of setting a man learned in one 'ology to work at another, according to a plan which we have before now seen adopted in this country.

The present volume, which is the first of the series, and is entirely from the pen of Professor Baird, gives a general account of all the species of Mammals collected by the various aforesaid expeditions, noticing at the same time, in their proper places, all those known to inhabit the continent of North America. It contains the technical descriptions of the families, genera, and species, remarks necessary to show their places in the system, their synonymy, and "an enumeration of all the different specimens collected." Other volumes will be devoted to the zoology of the separate expeditions, and enter more into particulars concerning habits, manners, &c. We beg to call particular attention to the plan of stating the exact locality of every specimen collected here adopted, which is most useful for working out the theory of geographical distribution,—a subject now attracting so much attention.

"The time is now passed," says a recent distinguished writer on natural history, "when the mere indication of the continent whence an animal had been obtained could satisfy our curiosity; and the naturalists who have an opportunity of ascertaining closely the particular circumstances under which the animals they describe are placed in their natural home, are guilty of a gross disregard to the interests of science when they neglect to relate them. Our knowledge of the geographical distribution of animals would be far more extensive and precise than it is now, but for this neglect; *every new fact relating to the geographical distribution of well-known species is as important to science as the discovery of a new species.*"

To this volume there are likewise attached indices of the particular localities mentioned, of the authorities referred to, of local names and of scientific names,—all most useful and valuable appendages to the work.

The total number of species of Mammalia now recognized by Professor Baird as inhabiting the North American continent amounts to 220, of which he has himself examined specimens, whilst there are 35 others more or less doubtful. This is a vast increase,—no less than 70 species having been added as new to Audubon and Bachman's list, the greater part being the result of these expeditions. This, too, is exclusive of *Cetacea, Pinnipedes*, and Bats, none of which are touched upon in the present treatise. The first two of these groups can hardly be said to belong to the land-fauna of North America; but we must allow something for the *Chiroptera*, to arrive at the true number of North American Mammalia. Major John Leconte in his paper in the seventh volume of the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' which is, we believe, the only modern authority on North American Bats, men-

tions fifteen species only as recognized by himself. This, however, raises the number of positively recognized Mammalia belonging to the North American fauna to 235, excluding Pinnipeds and Cetaceans.

Taking the several groups in the order in which they stand in Professor Baird's arrangement, we have first the *Insectivora*, containing Shrews and Moles,—together 26 species. Among these is a very remarkable (if reliable) addition to the American fauna in the shape of a second species of *Urotrichus*, a genus of *Talpidæ* hitherto embracing but one member, found in Japan. We may, however, notice the fact that but one imperfect specimen of this animal appears as yet to have been obtained; and an accurate comparison of it with the Japanese *Urotrichus* is requisite, before animals coming from localities so different can be recognized without doubt as the two only members of the same peculiar genus.

Of the *Carnivora* the large number of 46 are recognized as North American, made up of 9 *Felidæ*, 8 *Canidæ*, the *Bassaris astuta* of Mexico and Texas—sole representative of the family *Viverridæ*, 23 *Mustelidæ*, and 5 species of *Ursidæ*. This is exclusive of several species established by previous writers, but which Prof. Baird has, with much judgment, reduced to the rank of local varieties—such as the *Canis nubilus* of Say, and the *Felis maculata* of Horsfield and Vigors.

The *Marsupialia* in the northern portion of the American continent are represented by two species of the genus *Didelphis*, commonly known as 'Opossums.'

The Rodents are, again, extremely numerous. In the first place, the Squirrels of different genera, with the Marmots (so called), Prairie-dogs, and Beavers, make up no less than 41 members of the family *Sciuridæ*. The *Saccomyidæ*, or Pouched Mice, which, in accordance with Mr. Waterhouse's views, but in opposition to those of Professor Brandt, are grouped together, next follow, and are considered by Professor Baird as "one of the most natural families of Rodentia, although the component genera have been widely separated by different authors. In the external cheek-pouches," he remarks, "there is no other family which exhibits any approach to it. These open outside of the mouth, and are of variable depth and lined with short hairs to the bottom. When inverted and dried, they look like sacs on each side of the head." Of these peculiar animals, the range of which is confined to Northern America and the Antilles, 21 species are enumerated, as appertinent to the fauna of the United States. Two Porcupines of the North American form *Erethizon* are the only *Hystricidæ* met with in this part of the world; but there are no less than 52 *Muridæ* of varied forms; and 13 Hares and Rabbits, with a single *Lagomys*, give 14 species of the family *Leporidæ*. Altogether, therefore, the order Rodentia in North America, as elsewhere, plays a most important part as regards numbers, embracing 130 species—more than half the whole number of Mammals known to occur.

The order *Edentata* is represented within the limits of the United States by a single straggling species of Armadillo, which occurs

within the confines of Texas, and is somewhat doubtfully referred to the *Dasypus novem-cinctus* of Linnæus.

The Pachyderms have also but a single representative, the Collared Peccary, *Dicotyles torquatus*, which, it is remarked, "has a much wider range in North America than is supposed by European systematic writers. It not only occurs through Mexico, but even as far north in the United States as the Red River of Arkansas, in latitude 34°."

The Ruminants, however, muster more strongly, being better adapted for residence in the temperate regions of the North. In the first place, we have the Moose, *Alce americana*. Then two species of Reindeer are admitted under the titles *Rangifer caribou* and *R. grœnlandicus*, though it is allowed that their distinctness is questionable. It is highly desirable that accurate investigations should be made as to the difference of these animals *inter se*, and with the European *R. tarandus*, which is said to present somewhat corresponding variations. The genus *Cervus* and its subdivisions are represented by no less than six species, which are said to be all truly different, although the distinctions between *Cervus virginianus* and *C. leucurus*, and *C. macrotus* and *C. columbianus* require some further elucidation. North America contains only two Antelopes, the 'Prong-horn' (*Antilocapra americana*), and the so-called 'Mountain-goat' (*Haplocerus montanus*), and a single Sheep, the well-known Big-horn of the Rocky Mountains, *Ovis montana*. The Musk-ox of the Arctic regions (which, however, does not occur within the limits of the United States), and the Buffalo, *Bison americanus*, conclude the catalogue of North American Ruminants, making up a total of 14 animals of this order. What a contrast in this respect does North America present to Africa, where more than 60 species of Antelopes alone are already known to occur, and the list is daily increasing! For, though we may laugh at Buffon's theory as to the animals of America being merely degraded forms of those of the Old World, there can be no question that the 'Great Continent' is far more productive of animal forms of a more highly organized structure, and of a nature more adapted to meet the various wants of mankind.

Table of Genera of North American Mammalia, according to Professor Baird.

Order.	Family.	Genus.	Species examined.	Species not examined.
I. Rapacia	1. Soricidæ	1. Neosorex....	1	
		2. Sorex	12	4
		3. Blarina	7	
	2. Talpidæ.....	4. Scalops	4	1
		5. Condylura ..	1	
		6. Urotrichus ..	1	
			26	5

Order.	Family.	Genus.	Species examined.	Species not examined.
Brought forward	.....	.....	26	5
	3. Felidæ	7. Felis	5	
		8. Lynx	4	
	4. Canidæ	9. Canis	2	
		10. Vulpes.....	6	
	5. Viverridæ	11. Bassaris	1	
	6. Mustelidæ....	12. Mustela	2	
		13. Putorius	10	1
		14. Gulo	1	
		15. Lutra	2	
		16. Enhydra	1	
		17. Mephitis	5	1
		18. Taxidea	2	
	7. Ursidæ	19. Procyon	2	1
		20. Ursus	3	
II. Marsupiata ..	8. Didelphidæ ..	21. Didelphis ..	2	
III. Rodentia	9. Sciuridæ	22. Sciurus	12	6
		23. Pteromys ..	4	
		24. Tamias	4	
		25. Spermophilus	14	1
		26. Cynomys....	2	
		27. Arctomys ..	2	2
		28. Aplodontia ..	1	
		29. Castor.....	1	
		30. Castoroides..	1	
	10. Saccomyidæ .	31. Geomys	5	
		32. Thomomys ..	7	1
		33. Dipodomys ..	3	2
		34. Perognathus .	6	
	11. Muridæ	35. Jaculus	1	
		36. Mus.....	4	
		37. Reithrodon ..	4	1
		38. Hesperomys .	15	1
		39. Neotoma....	6	
		40. Sigmodon ..	2	
		41. Arvicola	16	11
		42. Myodes	3	
		43. Fiber	1	
	12. Hystricidæ ..	44. Erethizon ..	2	
	13. Leporidæ ..	45. Lepus	13	2
		46. Lagomys....	1	
IV. Edentata	14. Effodientia ..	47. Dasypus	1	
V. Pachydermata	15. Suidæ	48. Dicotyles....	1	
VI. Ruminantia ..	16. Cervidæ	49. Alce.....	1	
		50. Rangifer	2	
		51. Cervus.....	6	
	17. Cavicornia ..	52. Antilocapra..	1	
		53. Aplocerus ..	1	
		54. Ovis.....	1	
		55. Ovibos.....	1	
		56. Bos	1	
			220	35